CLAIMS

What is claimed is:

1. A burst detection system for detecting a burst in an incoming signal comprising:

a signal strength change detector for determining strength changes in the incoming signal;

signal strength detection logic for determining if a change in signal strength of a predetermined magnitude has occurred;

a pattern detector for monitoring patterns of symbols in the incoming signal to determine if a predetermined pattern is present; and

a burst detector for signaling a detection of a burst if the signal strength change detection logic determines that a signal strength change of predetermined magnitude has occurred and the pattern detector determines that a predetermined pattern of symbols is present.

2. The burst detection system of claim 1 wherein the signal strength change detector is a power change detector.

3. The burst detection system of claim 1 further comprising a signal strength indicator for indicating the strength of the incoming signal.

4. The burst detection system of claim 3 further comprising a short-term signal strength change detector for determining, responsive to the signal strength indicator, short-term changes in signal strength, and a long-term signal strength change indicator for determining, responsive to the signal strength indicator, long-term changes in signal strength.

5. The burst detection system of claim 4 wherein the signal strength detection logic is configured to determine, responsive to the short-term and long-term signal strength change detectors, if a short-term change in signal strength of a predetermined magnitude has occurred, and a long-term change in signal strength of a predetermined magnitude has occurred.

6. The burst detection system of claim 5 wherein the burst detector is configured to indicate the detection of a burst if the signal strength detection logic determines that a short-term change in signal strength of sufficient magnitude has occurred, and that a long-term change in signal strength of sufficient magnitude has occurred, and the pattern detector determines that a predetermined pattern of symbols is present in the incoming signal.

7. A burst detection system for detecting a burst in an incoming signal comprising:

a short-term signal strength change detector for determining short-term signal strength changes in the incoming signal;

a long-term signal strength change detector for determining long-term signal strength changes in the incoming signal;

signal strength change detection logic for determining if a short-term change in signal strength of predetermined magnitude has occurred, and a long-term change of signal strength of predetermined magnitude has occurred;

a pattern detector for monitoring patterns of symbols in the incoming signal to determine if a predetermined pattern is present; and

a burst detector for signaling a detection of a burst if the signal strength change detection logic determines that a short-term signal strength change of predetermined magnitude has occurred, and that a long-term signal strength change of predetermined

magnitude has occurred, and the pattern detector signals that a predetermined pattern of symbols is present.

8. The system of claim 5 further comprising a symbol detector for detecting symbols, or estimates thereof, in the incoming signal, and the pattern detector monitors the symbols or estimates provided by the symbol detector to determine if a predetermined pattern of symbols is present.

9. The system of claim 5 further comprising a signal strength indicator for indicating the strength of the incoming signal, and the short-term and long-term signal strength change detectors respectively determine short-term and long-term changes in signal strength responsive to the indication of signal strength provided by the signal strength indicator.

10. The system of claim 9 wherein the short-term signal strength change detector is configured to determine A_n, a current moving average of M samples of a_n, the indication of signal strength provided by the signal strength indicator, and B_n, a previous moving average of M samples of a_n, where M is a non-negative integer.

11. The system of claim 10 wherein the signal strength change detection logic is configured to determine if a short-term change in signal strength of sufficient magnitude has occurred by determining if the ratio of A_n to B_n exceeds a predetermined threshold.

12. The system of claim 10 wherein the short-term signal strength change detector is configured to determine C_n, a long-term average of a_n, in accordance with

the following expression: $C_n=(1-\alpha)\bullet C_{n-1}+\alpha\bullet a_n$, where α is less than or equal to 1, and indicates the relative weights to be given to C_{n-1} and a_n in the computation of C_n.

13. The system of claim 12 wherein the signal strength change detection logic is configured to determine if a change in signal strength of predetermined magnitude has occurred by determining if the ratio of A_n to C_n exceeds a predetermined magnitude.

14. The system of claim 8 wherein the incoming signal is a quadrature baseband signal, and the symbol detector determines soft estimates $\delta\theta_n$ of the symbols.

15. The system of claim 14 further comprising a symbol spaced differentiator for determining, responsive to the samples $\delta\theta_n$ from the symbol detector, $\delta\delta\theta_n=\delta\theta_n-\delta\theta_{n-L}$, where L is the number of samples/symbol.

16. The system of claim 15 wherein the pattern detector determines if a predetermined pattern of symbols is present responsive to the values $\delta\delta\theta_n$ from the symbol spaced differentiator.

17. A system for recovering data from an incoming packet represented by an incoming signal, the packet having a preamble and a body, comprising:

a short-term signal strength change detector for determining short-term signal strength changes in a portion of the incoming signal representing the packet preamble;

a long-term signal strength change detector for determining long-term signal strength changes in the portion of the incoming signal representing the packet preamble;

signal strength change detection logic for determining if a short-term change in signal strength of predetermined magnitude has occurred, and a long-term change of signal strength of predetermined magnitude has occurred;

a pattern detector for monitoring patterns of symbols in the portion of the incoming signal representing the packet preamble to determine if a predetermined pattern is present;

a burst detector for signaling a detection of a burst if the signal strength change detection logic determines that a short-term signal strength change of predetermined magnitude has occurred, and that a long-term signal strength change of predetermined magnitude has occurred, and the pattern detector signals that a predetermined pattern of symbols is present; and

data recovery logic for recovering data in the body of the packet responsive to the detection of a burst by the burst detector.

18. The system of claim 17 wherein the data recovery logic includes timing and frequency acquisition circuitry.

19. The system of claim 18 wherein the data recovery logic further includes demodulation circuitry.

20. A burst detection system for detecting a burst in an incoming signal comprising:

signal strength change detection means for determining strength changes in the incoming signal;

signal strength detection means for determining if a change in signal strength of a predetermined magnitude has occurred;

pattern detection means for monitoring patterns of symbols in the incoming signal to determine if a predetermined pattern is present; and

burst detection means for signaling a detection of a burst if the signal strength change detection logic determines that a signal strength change of predetermined magnitude has occurred and the pattern detector determines that a predetermined pattern of symbols is present.

21. A method for detecting a burst in an incoming signal comprising:

monitoring strength changes in the incoming signal to determine if a change in signal strength of a predetermined magnitude has occurred;

monitoring, in parallel with the previous monitoring step, patterns of symbols in the incoming signal to determine if a predetermined pattern is present; and

signaling detection of a burst if a signal strength change of predetermined magnitude has occurred and a predetermined pattern of symbols is present.

22. The method of claim 21 further comprising indicating the strength of the incoming signal, and monitoring strength changes in the incoming signal responsive thereto.

23. The method of claim 22 further comprising monitoring, responsive to the signal strength indication, short-term changes in signal strength, and long-term changes in signal strength.

24. The method of claim 23 further comprising determining if a short-term change in signal strength of a predetermined magnitude has occurred, and a long-term change in signal strength of a predetermined magnitude has occurred.

25. The method of claim 24 further comprising detecting a burst if a short-term change in signal strength of sufficient magnitude has occurred, a long-term change in signal strength of sufficient magnitude has occurred, and a predetermined pattern of symbols is present in the incoming signal.

26. A method for detecting a burst in an incoming signal comprising:

monitoring short-term signal strength changes in the incoming signal to determine if a short-term change in signal strength of predetermined magnitude has occurred;

monitoring long-term signal strength changes in the incoming signal to determine if a long-term change in signal strength of predetermined magnitude has occurred;

monitoring patterns of symbols in the incoming signal to determine if a predetermined pattern is present;

performing the foregoing three monitoring steps in parallel; and

signaling detection of a burst if a short-term signal strength change of predetermined magnitude has occurred, a long-term signal strength change of predetermined magnitude has occurred, and a predetermined pattern of symbols is present.

27. The method of claim 26 further comprising detecting symbols, or estimates thereof, in the incoming signal, and monitoring the symbols or estimates to determine if a predetermined pattern of symbols is present.

28. The method of claim 26 further comprising indicating the strength of the incoming signal, and monitoring short-term and long-term changes in signal strength responsive to the indication of signal strength.

29. The method of claim 28 further comprising determining A_n, a current moving average of M samples of a_n, the indication of signal strength, and B_n, a previous moving average of M samples of a_n, where M is a non-negative integer.

30. The method of claim 29 further comprising determining if a short-term change in signal strength of sufficient magnitude has occurred by determining if the ratio of A_n to B_n exceeds a predetermined threshold.

31. The method of claim 29 further comprising determining C_n, a long-term average of a_n, in accordance with the following expression: $C_n=(1-\alpha)\bullet C_{n-1}+\alpha\bullet a_n$, where α is less than or equal to 1, and indicates the relative weights to be given to C_{n-1} and a_n in the computation of C_n.

32. The method of claim 31 further comprising determining if a change in signal strength of predetermined magnitude has occurred by determining if the ratio of A_n to C_n exceeds a predetermined magnitude.

33. The method of claim 27 wherein the incoming signal is a quadrature baseband signal, and the method further comprises determining soft estimates $\delta\theta_n$ of the symbols.

34. The method of claim 33 further comprising determining, responsive to the samples $\delta\theta_n$, $\delta\delta\theta_n=\delta\theta_n-\delta\theta_{n-L}$, where L is the number of samples/symbol.

35. The method of claim 34 further comprising determining if a predetermined pattern of symbols is present responsive to the values $\delta\delta\theta_n$.

36. A method for recovering data from an incoming packet represented by an incoming signal, the packet having a preamble and a body, comprising:

monitoring short-term signal strength changes in a portion of the incoming signal representing the packet preamble to determine if a short-term change in signal strength of predetermined magnitude has occurred;

monitoring long-term signal strength changes in the portion of the incoming signal representing the packet preamble to determine if a long-term change in signal strength of predetermined magnitude has occurred;

monitoring patterns of symbols in the portion of the incoming signal representing the packet preamble to determine if a predetermined pattern is present;

performing the foregoing three monitoring steps in parallel;

signaling detection of a burst if a short-term signal strength change of predetermined magnitude has occurred, a long-term change in signal strength of predetermined magnitude has occurred, and a predetermined pattern of symbols is present; and

recovering data in the body of the packet responsive to detection of a burst.

37. The method of claim 36 further comprising acquiring timing and frequency responsive to detection of a burst.

38. The method of claim 37 further comprising demodulating the body of the packet responsive to detection of a burst.

39. A method for detecting a burst in an incoming signal comprising:

a step for monitoring strength changes in the incoming signal to determine if a change in signal strength of a predetermined magnitude has occurred;

a step for monitoring patterns of symbols in the incoming signal to determine if a predetermined pattern is present; and

a step for signaling a detection of a burst if a signal strength change of predetermined magnitude has occurred and a predetermined pattern of symbols is present.

40. The method of claim 39 further comprising a step for performing the first two monitoring steps in parallel.

41. The systems of any of claims 1, 7, 17, or 20 in a wireless communications device.

42. Computer readable media tangibly embodying any of the methods of claims 21, 26, 36, or 39.